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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/501,760

07/19/2004

Guether Hambitzer

2945-173

1108

6449

7590

11/13/2008

ROTHWELL, FIGG, ERNST & MANBECK, P.C.

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WASHINGTON, DC 20005

EXAMINER

CREPEAU, JONATHAN

ART UNIT

PAPER NUMBER

1795

NOTIFICATION DATE

DELIVERY MODE

11/13/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/501,760	<b>Applicant(s)</b> HAMBITZER ET AL.	
	<b>Examiner</b> Jonathan Crepeau	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-7 and 9-31 is/are pending in the application.
- 4a) Of the above claim(s) 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-7,9-13 and 15-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses claims 1, 3-7, 9-23, and newly added claims 24-31. All of the claims are newly rejected under 35 USC 103 over WO 00/44061, as necessitated by amendment. The double patenting rejection over U.S. Patent No. 6,730,441 has been withdrawn, although the rejection over U.S. Patent No. 6,709,789 is maintained. Accordingly, this action is made final.

### ***Claim Rejections - 35 USC § 103***

2. Claims 1, 3-7, 9, 10, 13, and 15-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 00/44061. Hambitzer et al (U.S. Patent 6,709,789) is taken as an English equivalent of WO '061 herein.

Hambitzer et al. '789 teach a nonaqueous electrochemical cell having a positive electrode (3), negative electrode (4), and a separator (5). As shown in Figure 2, the negative electrode comprises a substrate (shown at 4) and a plurality of salt particles (10) located between the separator and the substrate. The salt is preferably an alkali metal halide (see col. 3, line 7). The cell further comprises an electrolyte comprising sulfur dioxide (see col. 6, line 5). A negative active mass, which may comprise Li (see col. 6, line 1 et seq.), is deposited on the substrate and grows into the pores of the salt particles upon charging (see col. 3, line 20). Regarding claims 22

and 23, the positive electrode contains lithium cobalt oxide (see col. 6, line 1). The reference further teaches that the salt particles may be provided on a fibrous carrier material (18) that is in the form of a felt, fleece or fabric (see col. 4, line 51). The carrier material can be a "chemically inert, rigid material, e.g., glass or oxide ceramics." Regarding claim 5, the porous salt and the carrier material completely fill the space between the substrate and the separator.

The reference does not expressly teach that the ceramic is in the form of particles, thereby forming a "porous structure" as recited in claim 1.

However, the artisan would have been motivated to use the ceramic of Hambitzer et al. in a particulate form as the carrier for the salt particles. First, it is noted that the carrier of the reference is made up of a plurality of fibers. It would have been obvious to use spherical "particles," rather than fibers, as the carrier material, absent a new or unexpected result. In general, a change in shape of a prior art element is not considered to impart a patentable distinction (MPEP 2144.04). Accordingly, insofar as the "fibers" of the reference are not considered to be "particles," it would be obvious to use particles of the ceramic as the carrier material. Regarding claims 1 and 6, the ceramic (e.g., silica or alumina) would be inert, i.e., not ionically dissociating, to the cell components. Regarding claims 9, 10, 26, and 27, the ceramic would also have a melting point of at least 400C and a thermal conductivity of at least 20 W/mK.

Further regarding claims 1, 24, and 25, which recite that the volume proportion of solid particles in the porous structure is at least 40%, at least 50%, or at least 55%, respectively, it would be obvious to adjust the porosity of the ceramic particles so that a sufficient amount of lithium active mass is able to form on the substrate. Accordingly, the claimed ranges of particle volume proportion are not considered to distinguish over the reference.

Regarding claim 4, which recites that the porous structure contains at least two fractions of particles having different average particle sizes, this subject matter would also be rendered obvious. The sizes of the particles can be manipulated to affect packing density, and thus porosity, of the carrier material. Accordingly, it would be obvious to use more than one particle size in the carrier particles.

Regarding claim 16, which recites that the size of the salt particles is much smaller than the solid particles, this subject matter would be rendered obvious based on the fact that the purpose of the solid carrier particles is to support the salt particles. Therefore, it would be obvious to use solid particles that are larger than the salt particles that are being supported. Claims 17, 28, and 29 recite a size ratio of less than 1:2, 1:4, and 1:8, respectively, and would also be rendered obvious. Claims 18, 30, and 31, which recites that the volume of the salt particles is no more than 20%, 10%, or 5%, respectively, of the total solid volume of the porous structure, would also be rendered obvious based on the rationale provided above regarding the porosity of the porous structure.

3. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO '061 as applied to claims 1, 3-7, 9, 10, 13, and 15-31 above, and further in view of Aihara et al (2002/0102456).

Hambitzer et al. '789 do not expressly teach that the particles comprise a carbide or nitride of silicon, as recited in claims 11 and 12.

Art Unit: 1795

Aihara et al. is directed to a nonaqueous battery. In [0072] and [0074], the reference teaches an electrode comprising silicon carbide and silicon nitride powders as a filler.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Accordingly, the use of silicon carbide or silicon nitride as the ceramic of Hambitzer et al. would have been obvious to the skilled artisan.

### ***Double Patenting***

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1, 3-7, 9-13 and 15-31 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-15 of U.S. Patent No. 6,709,789. Although the conflicting claims are not identical, they are not patentably distinct from each other because the '789 patent claims render obvious the instant claims for the reasons stated above.

### ***Response to Arguments***

6. Applicant's arguments filed July 18, 2008 have been fully considered but they are not persuasive. Applicants state that the '789 patent does not teach the claimed limitations regarding the porous structure being determined by the size and shape of structure-forming solid particles which are made of a non-ionically dissociating material. However, as stated previously in the rejection over the '061 publication ('789 patent) and reiterated above, the "carrier material" of the reference renders these limitations obvious. The reference teaches a fibrous carrier material that is in the form of a felt, fleece or fabric. The position is maintained that it would be obvious to use a carrier material in particulate form, absent a showing of any criticality resulting from this shape. Applicants further state that, regarding the volume proportion limitation in claim 1, "as noted in the present application, however, it would have been expected that such close packing (resulting in narrow pores) would result in a detrimental increase in electrical resistance and thus a reduction of the maximum charging and/or discharging currents." However, it is noted that the '789 patent, at column 4, line 35, teaches that "the layer material is made by coating a porous carrier material 18 with the salt 10 in such a manner that its pores 19 are not completely closed." This disclosure suggests that the porous structure of the '789 patent has a

Art Unit: 1795

relatively low porosity, and conversely a relatively high volume fraction of material. However, the porosity is not so low as to close some of the pores. Therefore, Applicant's argument that "a person having ordinary skill in the art would have expected a volume proportion of solid particles in the porous structure of 40% or higher resulting in narrow pores to yield detrimental effects" is not persuasive because the '789 patent indicates that narrow pores are in fact part of the structure. Furthermore, there is not yet believed to be sufficient evidence of record establishing the criticality of the claimed volume fraction of the solid particles being at least 40%. Accordingly, the rejection as stated above is believed to be proper.

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.



Art Unit: 1795

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jonathan Crepeau/  
Primary Examiner, Art Unit 1795  
November 11, 2008